

FIG. 78.—Diagram of the structure and musculature of a typical insect maxilla, suggesting that the cardo and stipes represent the coxopodite (*Cxpd*) and the palpus the telopodite (*Tlpd*) of a leg.

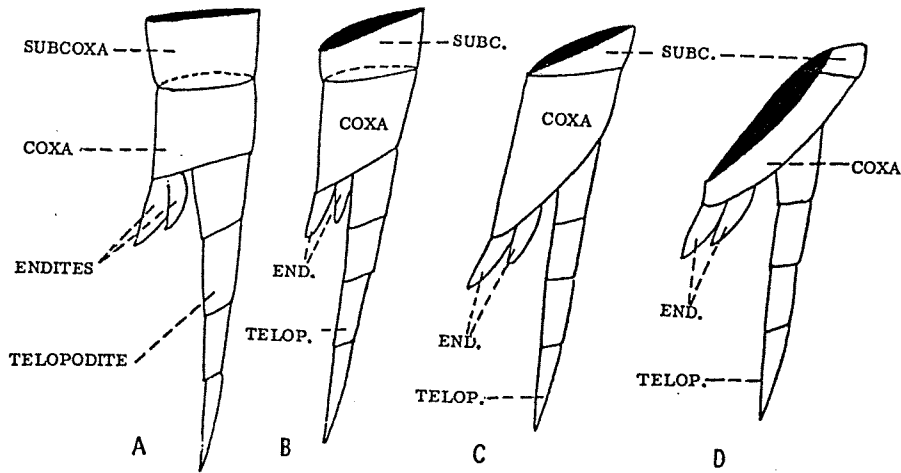
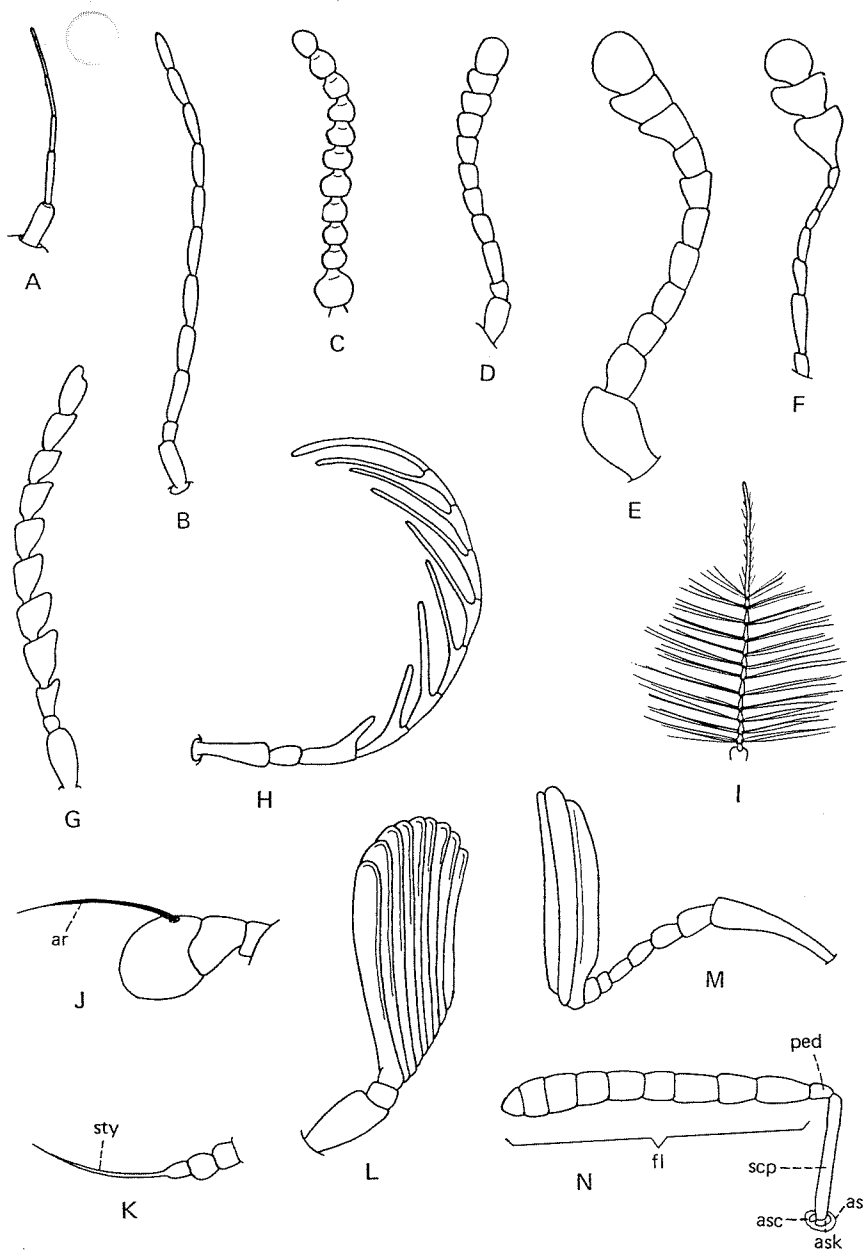
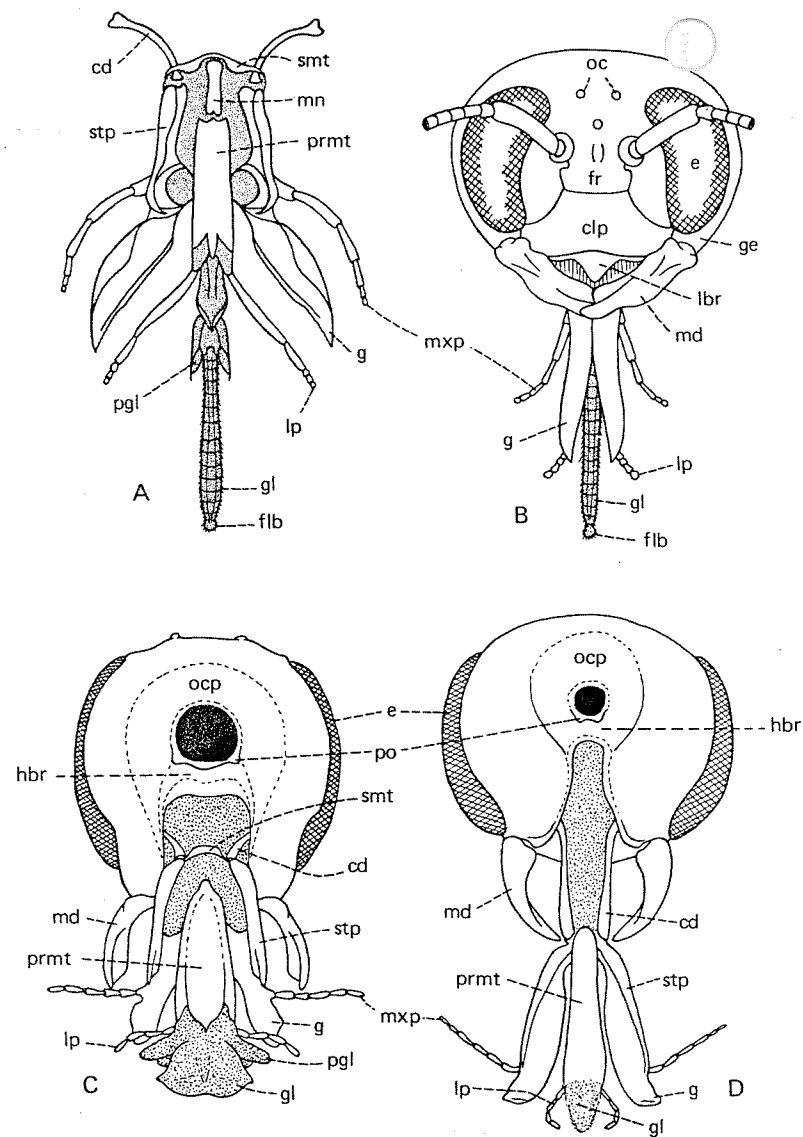


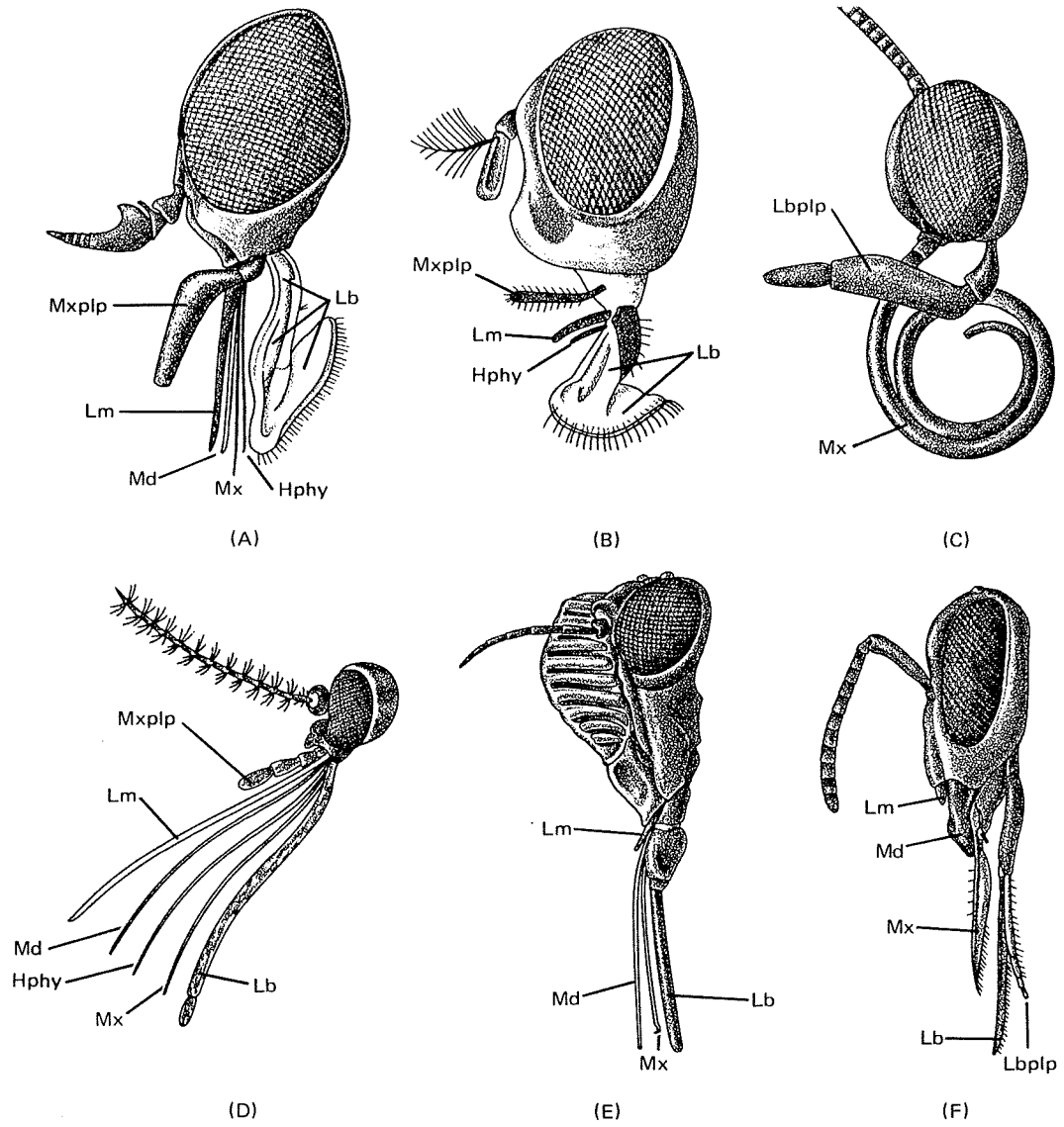
Fig. 30. Diagram showing the derivation of maxilla from the a primitive appendage.



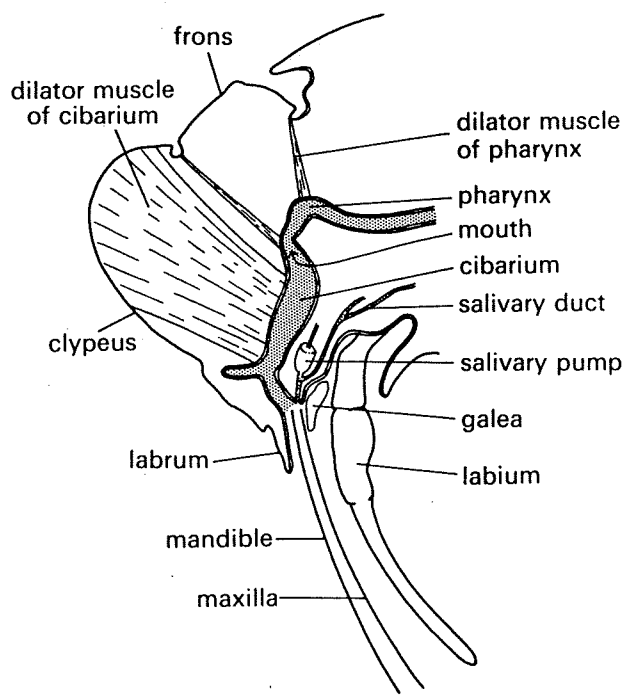
**Figure 14.** Types of antennae. **A**, setaceous (dragonfly); **B**, filiform (ground beetle); **C**, moniliform (wrinkled bark beetle); **D**, clavate (darkling beetle); **E**, clavate (ladybird beetle); **F**, capitate (sap beetle); **G**, serrate (click beetle); **H**, pectinate (fire-colored beetle); **I**, plumose (male mosquito); **J**, aristate (syrphid fly); **K**, stylate (snipe fly); **L**, flabellate (cedar beetle); **M**, lamellate (June beetle); **N**, geniculate (chalcid). Antennae such as those in D-F, L, and M are also called clubbed. *ar*, arista; *as*, antennal suture; *asc*, antennal sclerite; *ask*, antennal socket; *fl*, flagellum; *ped*, pedicel; *scp*, scape; *sty*, style.



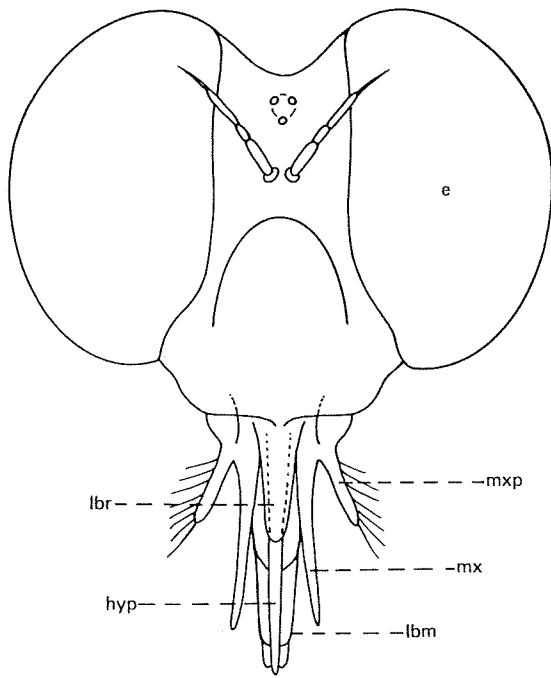
**Figure 16.** Head and mouth part structure in bees. **A**, mouth parts of *Xylocopa* (Anthophoridae, Xylocopinae), posterior view; **B**, same, anterior view; **C**, mouth parts of *Hylaeus* (Collitidae, Hylaeinae), posterior view; **D**, mouth parts of *Sphecodes* (Halictidae), posterior view. *cd*, cardo; *clp*, clypeus; *e*, compound eye; *flb*, flabellum; *fr*, frons; *g*, galea; *ge*, gena; *gl*, glossa; *hbr*, hypostomal bridge; *lbr*, labrum; *lp*, labial palp; *md*, mandible; *mn*, mentum; *mxp*, maxillary palp; *oc*, ocelli; *ocp*, occiput; *pgl*, paraglossa; *po*, postocciput; *prmt*, prementum; *smt*, submentum; *stp*, stipes.



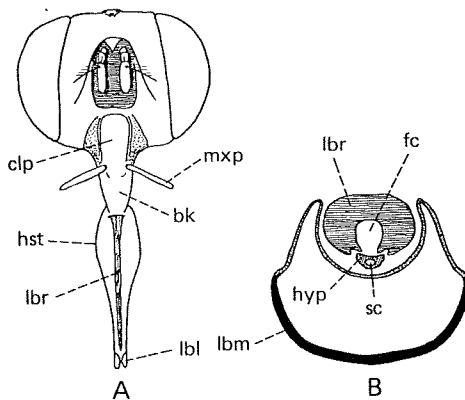
**Figure 31.** Some modifications of insect mouthparts from the basic chewing type. (A) cutting-sponging of a horsefly; (B) sponging of the house fly; (C) siphoning of a butterfly; (D) piercing-sucking of a mosquito; (E) piercing-sucking of a cicada; (F) chewing-lapping of the honeybee; Hyphy, hypopharynx; Lb, labium; lbplp, labial palp; Lm, labrum; Md, mandible; Mx, maxilla; Mxplp, maxillary palp.



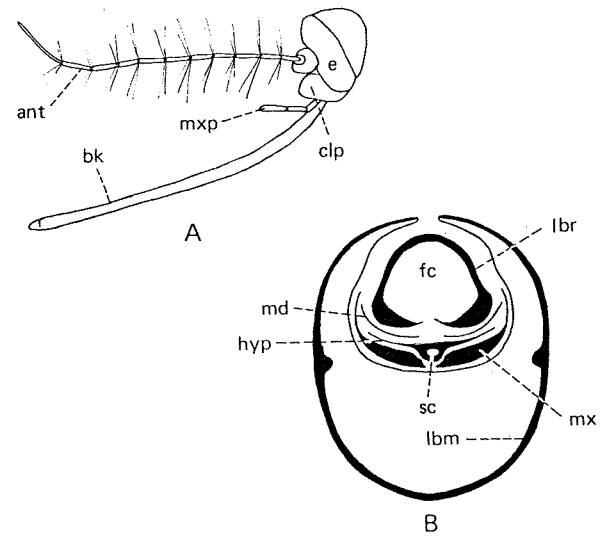
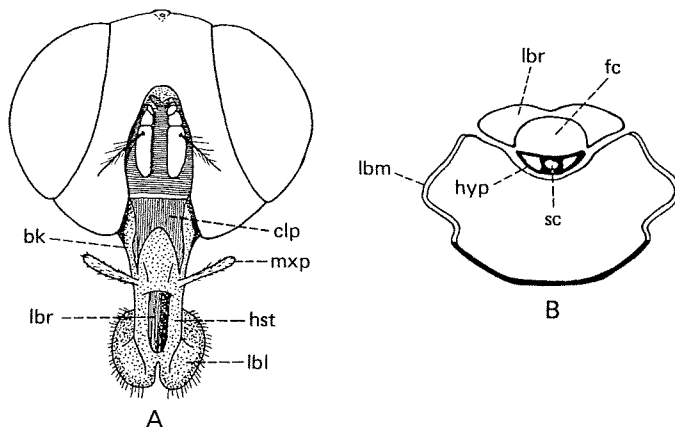
**Fig. 16.** Median vertical section of the head of a cicada showing the enlargement of the cibarial dilator muscles in the formation of a sucking pump (after Snodgrass, 1944).



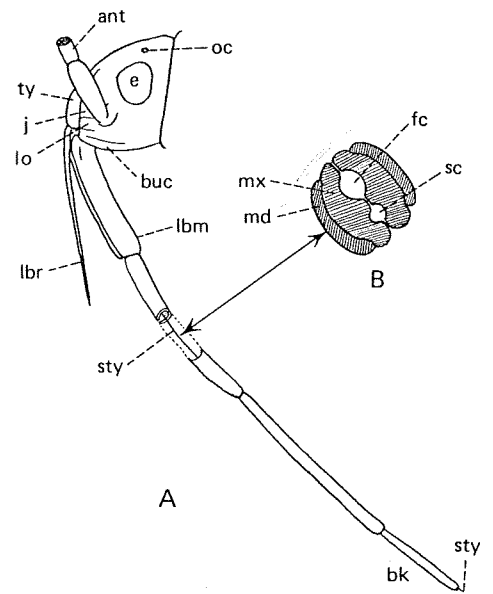
**Figure 20.** Head and mouth parts of a robber fly. *e*, compound eye; *hyp*, hypopharynx; *lbm*, labium; *lbr*, labrum; *mx*, maxillary stylet; *mxp*, maxillary palp.



**Figure 21.** Mouth parts of the stable fly, *Stomoxys calcitrans* (L.). **A**, anterior view of head; **B**, cross section through haustellum. *bk*, rostrum; *clp*, clypeus; *fc*, food channel; *hst*, haustellum; *hyp*, hypopharynx; *lbl*, labellum; *lbm*, labium; *lbr*, labrum; *mxp*, maxillary palp; *sc*, salivary channel. (Redrawn from various sources; somewhat diagrammatic.)



**Figure 19.** Mouth parts of a mosquito. **A**, head of *Aedes*, lateral view; **B**, cross section of proboscis of *Anopheles*. *ant*, antenna; *bk*, proboscis; *clp*, clypeus; *e*, compound eye; *fc*, food channel; *hyp*, hypopharynx; *lbm*, labium; *lbr*, labrum; *md*, mandible; *mx*, maxilla; *mxp*, maxillary palp; *sc*, salivary channel. (B redrawn from Snodgrass, after Vogel.)



**Figure 18.** Mouth parts of the large milkweed bug, *Oncopeltus fasciatus* (Dallas). **A**, lateral view of the head showing beak, with the labrum detached from front of beak; **B**, cross section of stylets (somewhat diagrammatic). *ant*, antenna; *bk*, beak; *buc*, buccula; *e*, compound eye; *fc*, food channel; *j*, jugum; *lbm*, labium; *lbr*, labrum; *lo*, lorum; *md*, mandible; *mx*, maxilla; *oc*, ocellus; *sc*, salivary channel; *sty*, stylets; *ty*, tylus.

**Figure 22.** Mouth parts of the house fly, *Musca domestica* L. **A**, anterior view of head; **B**, cross section through haustellum. *bk*, rostrum; *clp*, clypeus; *fc*, food channel; *hst*, haustellum; *hyp*, hypopharynx; *lbl*, labellum; *lbm*, labium; *lbr*, labrum; *mxp*, maxillary palp; *sc*, salivary channel. (Redrawn from Snodgrass, by permission of McGraw-Hill Book Co., Inc.)

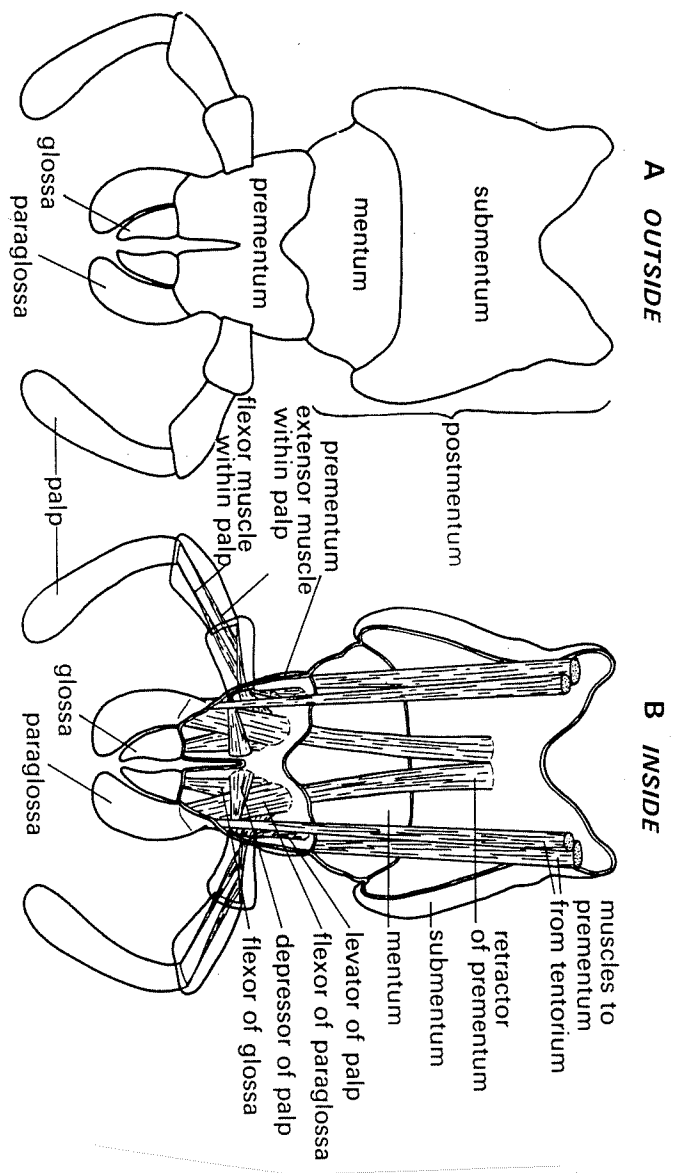


Fig. 14. Diagrams of the labium from the outside (A) and the inside (B) to show the musculature (after Snodgrass, 1944).

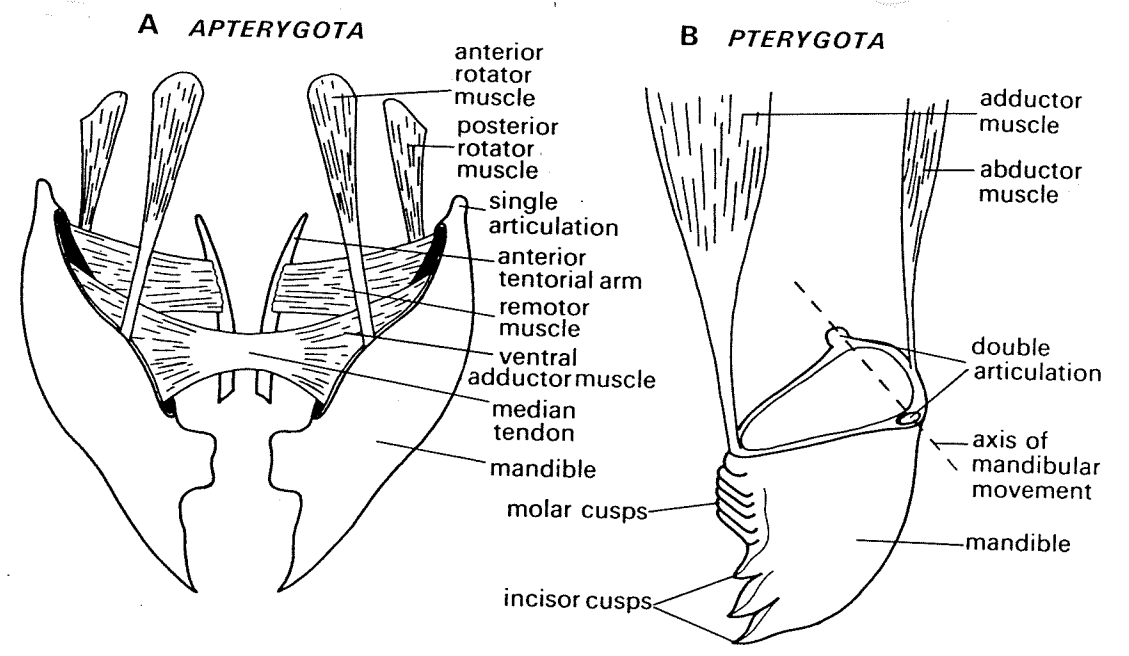


Fig. 12. Diagrams of the mandibles of (A) an apterygote, in which only some of the muscles are shown, and (B) a pterygote insect (after Snodgrass, 1935, 1944).

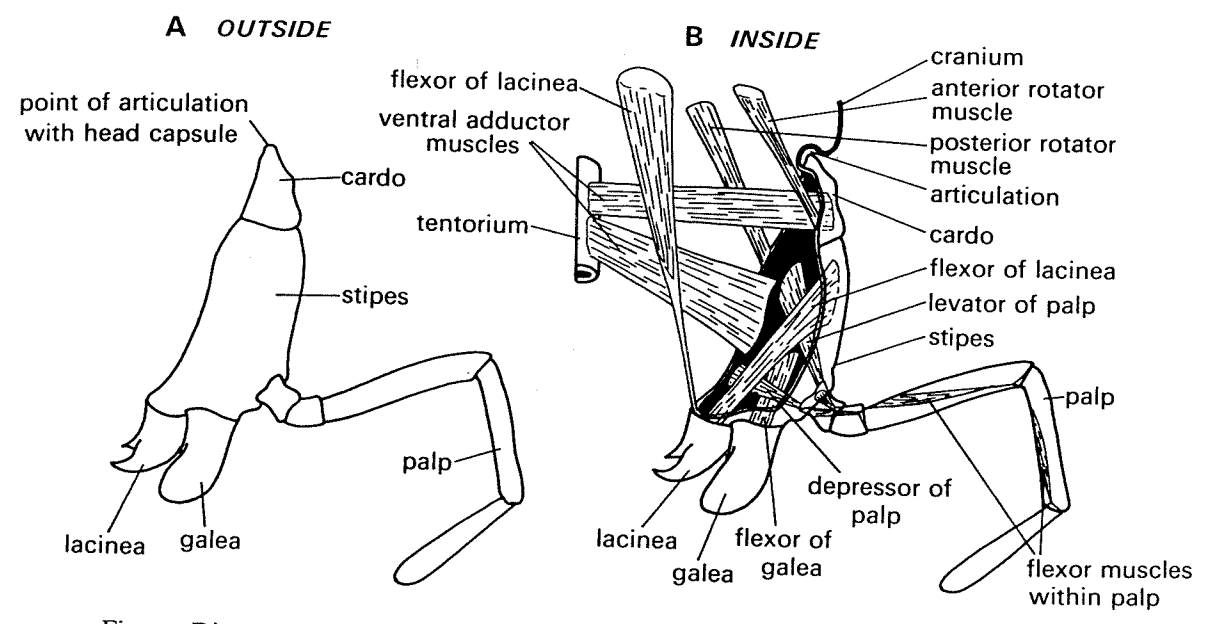


Fig. 13. Diagrams of the maxilla from the outside (A) and the inside (B) to show the musculature (after Snodgrass, 1935).